

CLASS : 11

Register
Number

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SECOND MID TERM TEST - 2023

Time Allowed : 1.30 Hours]

PHYSICS

[Max. Marks : 35

PART - A

Answer all the questions

5x1=5

- If the acceleration due to gravity becomes 4 times its original value then escape speed
 - remains same
 - 2 times of original value
 - becomes halved
 - 4 times of original value
- Which of the following is not a scalar?
 - viscosity
 - surface tension
 - pressure
 - stress
- Universal gas constant is
 - 8.314 J/mol.k
 - $5.67 \times 10^{-8} \text{ w m}^{-2} \text{ k}^{-4}$
 - 611.6 Pascal
 - $6.023 \times 10^{23} \text{ mol}^{-1}$
- For a given material the Poisson's ratio is $(1/3)^{\text{th}}$ of Young's modulus is its Poisson's ratio
 - 0
 - 0.25
 - 0.3
 - 0.5
- When a cycle tyre suddenly bursts, the air inside the tyre expands this process is
 - isothermal
 - adiabatic
 - isobaric
 - isochoric

Answer any three questions. Question no.10 is Compulsory.

3x2=6

- What are Geostationary and Polar satellites?
- State Hooke's law of elasticity.
- Which one of them is more elastic steel (or) Rubber. Why?
- What is Wien's Law?
- A student comes to school by a bicycle whose tyre is filled with air at a pressure 240 K Pa at 27°C. She travels 8 km to reach the school and the temperature of the bicycle tyre increases to 89°C. What is the change in pressure in the tyre when the student reaches school?

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III Answer any three of the following. Q.No.15 is Compulsory.

3x3=9

- 11 Derive the time period of satellite orbiting the earth
- 12 Distinguish between streamlined flow and turbulent flow.
- 13 In an adiabatic expansion of the air, the volume is increased by 4%. What is percentage change in pressure? (for air $\gamma = 1.4$)
- 14 Explain the variation of g with altitude.
- 15 A gas expands from volume 1m^3 to 2m^3 at constant atmospheric pressure a) calculate the work done by the gas. b) represent the work done in a P-V diagram.

IV Answer the following in detail:

3x5=15

16. a) Derive the workdone in an adiabatic process.
(Or)
b) Derive an expression for escape speed.
17. a) Explain the different types of modulus of elasticity. *kinetic energy*
(Or)
b) State and Prove Bernoulli's theorem for a flow of incompressible non viscous and streamline flow of fluid.
- 18 a) Explain in detail Newton's law of cooling.
(Or)
b) Derive Meyer's Relation for an ideal gas.